

PROBLEMS ASSOCIATED WITH TOOTH PLATES AND TAXONOMY IN AUSTRALIAN CERATODONT LUNGFISH

EXTENDED ABSTRACT

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Most Mesozoic and Cenozoic species of lungfish have been described on the basis of tooth plates, because jaw bones and other parts of the fish are rarely preserved. Tooth plates are not however, universally regarded as valuable for taxonomy (Peyer, 1917; Schultze, 1981), and they are definitely affected by environment, diet, and stage of growth (Kemp, 1977). Attempts have been made, to use features of the jaw bones as specific characters (Martin, 1982, 1984; Kemp & Molnar, 1981; Kirkland, 1987), but the jaw bones may also be susceptible to variation from similar sources.

Character analysis of a large number of jaw bones and tooth plates of the Recent Australian lungfish, *Neoceratodus forsteri* (Krefft, 1870), has been used to determine the effects of environment, diet, and stage of growth on the tooth plates and attached jaw bones of a single species, as well as the extent of inherent variation. The specimens were sorted into groups according to size and geographic origin, and characters of tooth plates and jaw bones were determined within each group. Results indicate that jaw bones were no more reliable than tooth plates for taxonomic purposes, since they were subject both to inherent variation and to the effects of diet. It is, however, possible to use both tooth plate and jaw bone characters as specific determinants, provided that differences due to inherent variation, growth, diet, and environment are recognized. Of these factors, differences due to environment and diet pose the greatest problem, and those due to growth the least.

The character analysis, divided into categories based on results obtained in the Recent species, can be used for determining species in the Mesozoic and Cenozoic lungfish of Australia, groups for which biometric analysis produces unreliable results (Kemp & Molnar, 1981). Tooth plates are of value in the taxonomy of Mesozoic and Cenozoic lungfish, and produce consistent results. A paper describing and discussing the character analysis in full has been submitted for publication elsewhere.

□ *Dipnoi, Taxonomy, Dentition. Australia.*

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